

Lesson 9

The Number Line

Problem Solving

Problem-Solving Strategy: Use Logical Reasoning

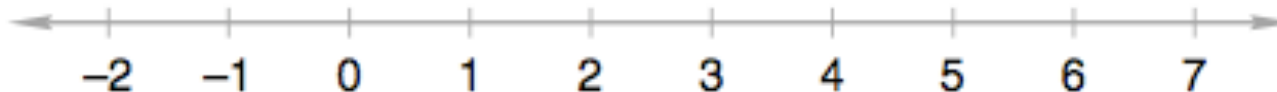
As you sit at your desk facing forward, you can describe the locations of people and objects in your classroom compared to your position. Perhaps a friend is two seats in front and one row to the left. Perhaps the door is directly to your right about 6 feet. Describe the location of your teacher's desk, the pencil sharpener, and a person or object of your choice.

New Terms

- Counting Numbers
- Negative Numbers
- Number Line
- Whole Numbers

Number Line

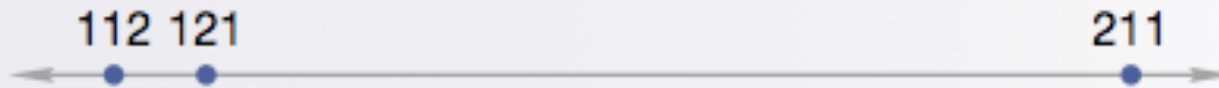
A **number line** is a way to show numbers in order.



The arrowheads show that the line continues without end and that the numbers continue without end. The small marks crossing the horizontal line are called *tick marks*. Number lines may be labeled with various types of numbers. The numbers we say when we count (1, 2, 3, 4, and so on) are called **counting numbers**. All the counting numbers along with the number zero make up the **whole numbers**.

Number Line

On a number line, these three numbers appear in order from least (on the left) to greatest (on the right).



For our answer, we write

112 121 211

Comparison

When we **compare** two numbers, we decide whether the numbers are equal; if they are not equal, we determine which number is greater and which is lesser. We show a comparison with symbols. If the numbers are equal, the comparison symbol we use is the **equal sign** (=).

$$1 + 1 = 2$$

Comparison

If the numbers are not equal, we use one of the **greater than/less than symbols** ($>$ or $<$). When properly placed between two numbers, the small end of the symbol points to the lesser number.

Compare

Compare: 5012 ○ 5102

Solution

In place of the circle we should write =, >, or < to make the statement true. Since 5012 is less than 5102, we point the small end to the 5012.

$$5012 < 5102$$

Example

Compare: 5012 ○ 5102

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In place of the circle we should write =, >, or < to make the statement true. Since 5012 is less than 5102, we point the small end to the 5012.

$$5012 < 5102$$

Example

Compare: $16 \div 8 \div 2 \bigcirc 16 \div (8 \div 2)$

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Before we compare the two expressions, we find the value of each expression.

$$\underbrace{16 \div 8 \div 2}_1 \bigcirc \underbrace{16 \div (8 \div 2)}_4$$

Since 1 is less than 4, the comparison symbol points to the left.

$$16 \div 8 \div 2 < 16 \div (8 \div 2)$$

Write

Use digits and symbols to write this comparison:

One fourth is less than one half.